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ABSTRACT

The effects of four language units to teach inner-city children to read words and syllables were compared using 86 children from 4 kindergarten classes in an Oakland, California, elementary school. The language units and beginning reader approaches utilizing them were: the grapheme/phoneme (synthetic), the morpheme (similar spelling pattern), the morphophoneme/morphographeme (contrastive spelling pattern), and the whole word (sight) approach. Randomly assigned subjects were taught by the experimenter in groups of approximately six, for two 15-minute periods twice weekly. Teaching content was a list of 28 words. At the end of 10 weeks, the subjects were individually tested on their recall of the words taught and on their ability to transfer to 26 similar words. Analysis of variance results favored the two spelling pattern treatments, but found no significant differences among the transfer scores when compared by treatment. It was concluded that beginning reading instruction should employ language units providing for spelling pattern emphasis in order to positively affect recall. References, tables, and samples of materials are included. (Author/MS)

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A COMPARISON OF FOUR LANGUAGE UNITS IN TEACHING BEGINNING READING

by

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A Comparison of Four Language Units In Teaching Beginning Reading

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The effectiveness of four language units and beginning reading approaches utilizing them was compared for four kindergarten classes in a lower socio-economic urban school. The language units and approaches were: the grapheme/phoneme (synthetic), the morpheme (similar spelling pattern), the morphophoneme/morphographeme (contrastive spelling pattern), and the whole word (sight) approach.

Randomly assigned subjects were taught by the experimenter in groups of approximately six, for two 15-minute periods twice weekly. Teaching content was a list of 28 words. At the end of the ten weeks, subjects were individually tested on their recall of the words taught and on their ability to transfer to 26 similar words.

The recall scores favored the two spelling pattern treatments. No significant differences were found among the transfer scores when compared by treatment.

The conclusion was that beginning reading instruction should employ language units providing for spelling pattern emphasis in order to positively affect recall.

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Is one language unit more efficient than another in teaching kindergarten children to read? Is there a relationship between the choice of language unit used to teach words and later recall of those words? Does the language unit utilized in teaching initial words affect ability to transfer to new words? Recent research offers some clues to the identity of the significant language unit(s) in reading, but there is need for additional research "to support a particular perceptual unit or units leading to a decoding skill in reading" (Ruddell, 1969).

This study compared the effects of using four different language units to teach kindergarten children to read a limited number of words and syllables. For the purpose of this study, reading was defined as the ability to pronounce a limited list of words or syllables. Bases for comparison were the verbally-demonstrated recall of the words and syllables taught and

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the ability to transfer to similar words and syllables as shown by pronunciation of such words and syllables. The null hypothesis was tested, stating that there would be no significant difference between the effects of the four treatments. Parallel questions were formulated regarding possible relationships of language units and learner characteristics. Specific characteristics used as a basis for comparison were measured intelligence, sex, prior knowledge of letter names, and prior knowledge of phonemes.

Although initial whole word or sight reading programs retain some supporters, it is generally accepted that decoding ability is required for independence in reading. In her comparison of 67 of the major reading studies conducted in the last half century, Chall (1967) concluded that a code emphasis in beginning reading produced better results than did a meaning emphasis. Bishop (1963) stated that reading could occur without the knowledge of grapheme-phoneme correspondences, but that such knowledge is necessary in order to be able to transfer to reading new words.

In Samuels' (1970) investigation of the comparative importance of letter-name and letter-sound instruction to reading success, he found that it was letter-sound training which facilitated the acquisition of reading skills. Johnson (1970) gathered data with 424 first grade pupils which verified the finding that letter-name training resulted in letter-name knowledge, but not in increased reading ability.

Gibson and others (1963) proposed the hypothesis that neither single letters nor whole words were relevant graphic units in reading. She wrote that the important unit is a higher-order invariant composed of one or more letters in a given word position which stand for a specified pronunciation.

Dual-association learning is suggested as a result of Levin's (1963) study, where teaching the multiple correspondences of similar language units resulted in greater transfer than did teaching only one correspondence for a letter or a group of letters. Fries (1963) similarly advocates a contrasting spelling-pattern approach to teaching reading.

Ruddell (1969) suggested a comparison of consistent letter correspondences with contrastive letter patterns.

The four treatments applied in this study reflect the findings and opinions summarized above. The whole word (sight) approach, the individual grapheme-phoneme approach (synthetic), the similar spelling pattern, and the contrastive spelling pattern were included as treatments. Although use of the null hypothesis indicates a statistical prediction of no differences, it was expected that the three methods involving decoding would all surpass the whole word approach.

METHOD

Subjects

Subjects in the experiment were 86 kindergarten children in four classes at an elementary school in Oakland, California. By race the sample was 76% Negro, 13% Spanish surname, 10% Other Caucasion, and 1% Oriental. Socio-economic level is reflected by the breadwinners' employment categories: approximately two-fifths blue-collar, one-fourth each white collar and unemployed, and the remainder service or tradesmen.

Design

The research design was a modified experimental treatment/control group design. Although each of the four groups received an experimental

treatment, only three of the treatments involved decoding; therefore, the fourth group functioned as a control for the other three.

Placement in one of the four treatments was by random assignment after ranking within each of the four kindergarten classes according to pre-treatment scores on the Pintner-Cunnignham Primary Test. Both that test and the Murphy-Durrell Diagnostic Readiness Test had been administered in late fall of 1969 with the purpose of establishing a rank order of readiness on the basis of the combined scores. However, scores on the Learning Rate Subtest of the Murphy-Durrell were considered to be too low to be of use. Scores from the other two subtests, Letter Names and Phonemes, were used in the later analysis of the data.

The four treatments were repeated four times on each teaching day, so that there were sixteen groups of approximately six children each receiving instruction for periods of fifteen minutes. The semiweekly training began in January of 1970 and continued for ten weeks. All instruction was by the experimenter.

Materials

Teaching materials were seven-by-nine inch tagboard cards on which 28 words and syllables were printed, two to a card. The selection of the pairs of words for the cards differed according to the treatments. The words and syllables used in instruction and as measures of transfer are listed in Tables A and B.

Procedure

During a typical 15-minute training period, from two to four of the 28 words and syllables were presented. Sometimes words or syllables were reviewed.

All 28 words and syllables had been presented to all of the subjects by the end of the ten week training period.

The whole word (sight) and synthetic (grapheme/phoneme) treatments used the same set of cards, in which words were paired so that the two words had no letters in common (i.e., tap and rub).

In the whole word treatment, the graphic form was presented simultaneously with its oral counterpart. The subjects were encouraged to pronounce the words simultaneously with or following the experimenter's pronouncing. Several children attempted to spell or "sound out" the words without reinforcement.

The grapheme/phoneme treatment involved the production of the sounds represented by each letter and then the blending or synthesis of the letters into the word or syllable. The subjects pronounced the sounds and words with or following the experimenter.

A third treatment presented the words in pairs according to similarity of spelling pattern (i.e., tap and nap). The subjects pronounced the first word with or following the experimenter, and they were then allowed to attempt to identify the second word. If after two or three tries, the pupils still were unable to pronounce the second word, the word was supplied for them.

The fourth treatment utilized contrastive predictable spelling patterns (i.e., tap and tape). Each pair of words was an example of a contrastive spelling pattern. When the pair presented a new contrasting pattern, the children pronounced the words with or following the experimenter. When it was a pattern already encountered in a previous pair of words, the top word was pronounced for them and they were allowed to attempt the identification of the second word, which was supplied after two or three incorrect tries.

Meaning was handled as follows. When the word was obviously familiar to the children, such as Dad, no comment was made; when it was a word which few would know, such as nape, it was defined; and when it was a totally unfamiliar word, a meaning was assigned to it. ("Dade is a place.") This assignment of meaning seemed to be accepted, although some words were incorrectly interpreted because of dialectic differences (i.e., Dade sounded like dead; tube sounded like tooth when the ending phoneme was not clearly enunciated).

Post-tests

The individually-administered post-tests had two parts. Recall was measured by pronunciation of the 28 words and syllables which had been taught. Transfer ability was reflected in the pronunciation of 26 words and syllables containing the same correspondences as the words and syllables which had been taught, but each differing in one letter. (See Charts A and B for lists of the words and syllables.)

Analysis of the Data

Recall and transfer scores earned on the post-tests were analyzed according to one-way analysis of variance. The effects of the four treatments were compared for all of the subjects, and then for groups classified by intelligence scores, sex, prior knowledge of letter names, and prior knowledge of phonemes. When significant ($p < .05$) F ratios appeared, Scheffé Contrasts were computed as post hoc comparisons.

FINDINGS

Of a total score of 28 possible on the recall post-test, the mean number of words pronounced in each treatment was: Whole Word (Sight) 6.26 (S.D. 7.23); Grapheme/Phoneme (Synthetic) 5.30 (S.D. 3.94); Similar Spelling Pattern 12.13 (S.D. 8.37) and Contrastive Spelling Pattern 12.19 (S.D. 6.61). Based upon a one-way analysis of variance, the hypothesis that there would be no significant difference between the treatment scores on recall was not confirmed. (See Table 1.)

TABLE 1

Effect of Treatment Upon Recall of Words and Syllables

Treatment Group	A	B	C	D
Sample Size	23	23	21	19
Mean	5.30	12.13	12.19	6.26
Standard Deviation	3.94	8.37	6.61	7.23

Analysis of Variance

Source of Variance	Sum of Squares	DF	Mean Square	F-Ratio
Between Groups	895.55	3	298.52	6.62*
Within Groups	3696.40	82	45.08	
Total	4591.95	85		

$F\ 6.62 > F_{3,\ 82} = 3.12$ * <.05.

A = Grapheme/Phoneme (Synthetic) B = Morpheme (Similar Spelling Pattern)

C = Morphophoneme/Morphographeme (Contrastive Spelling Pattern) D = Whole Word (Sight)

Children taught by either of the two spelling pattern treatments were able to recall a higher number of words than were children taught by a letter-by-letter or a whole word approach. (See Table 2 for contrast comparisons.)

TABLE 2

Pairwise Simple Comparisons for the Data of Table 1
(Contrasting the Treatments on Recall Scores)

Comparison	Value of ψ	SE^2	Lower Limit	Upper Limit	Decision
$\psi_1 = A - B$	-6.83	3.92	-12.89	-.77	*
$\psi_2 = A - C$	-6.89	4.11	-12.97	-.71	*
$\psi_3 = A - D$	- .96	4.33	- 7.32	5.40	NS
$\psi_4 = B - C$	- .06	4.11	- 6.24	6.12	NS
$\psi_5 = B - D$	5.87	4.33	- .49	12.23	NS
$\psi_6 = C - D$	5.93	4.52	- .59	12.45	NS

* < .05

A = Grapheme/Phoneme (Synthetic) B = Morpheme (Similar Spelling Pattern)

C = Morphophoneme/Morphographeme (Contrastive Spelling Pattern) D = Whole Word (Sight)

When the recall scores were analysed according to characteristics of the subjects in each treatment, only the similar spelling pattern treatment made a significant difference, and then only in the following categories: children who measured 79 I.Q. and below on the Pintner Cunningham; or who had considerable knowledge of letter names (16 or more on the Murphy-Durrell); or who had little prior knowledge of phonemes (below 16 on the Murphy-Durrell).

The goal of reading instruction, the ability to transfer to new words, was not realized in this study. The hypothesis that no significant differences between treatment would appear in transfer scores was confirmed. (See Table 3.)

TABLE 3

Effect of Treatment upon Transfer to Similar Words and Syllables

Treatment Group	A	B	C	D
Sample Size	23	23	21	19
Mean	.78	3.70	3.43	1.26
Standard Deviation	2.75	4.76	5.04	3.18

Analysis of Variance

Source of Variance	Sum of Squares	DF	Mean Square	F-Ratio
Between Groups	144.91	3	48.30	2.93
Within Groups	1353.61	82	16.51	
Total	1498.52	85		

$F\ 2.93 \not> F_{3, 82} = 3.12$

A = Grapheme/Phoneme (Synthetic) B = Morpheme (Similar Spelling Pattern)

C = Morphophoneme/Morphographeme (Contrastive Spelling Pattern) D = Whole Word (Sight)

Three subgroups of children did perform significantly better in transfer scores after having been taught in one of the two spelling pattern treatments. Either spelling pattern treatment favored girls and children with little prior knowledge of letter names; children with low measured intelligence

scored more highly after instruction in the similar spelling pattern treatment.

Although the treatment difference for transfer was not statistically significant, the numbers of new words and syllables read on the transfer test did favor the spelling pattern treatments. (See Table 3.) Of a total of 26 possible on the transfer post-test, the mean number of words pronounced in each treatment was: Whole Word (Sight) 1.26 (S.D. 3.18); Grapheme/Phoneme (Synthetic) .78 (S.D. 2.75); Similar Spelling Pattern 3.70 (S.D. 4.76); and Contrastive Spelling Pattern 3.43 (S.D. 5.04).

DISCUSSION

The main implication to be drawn from the results of this study is that beginning reading instruction should emphasize spelling pattern approaches more than letter-by-letter or sight approaches in order to positively affect recall of words taught. The study does not predict success of one approach over another in promoting reading transfer. One fact that may have contributed to this latter circumstance is that the training period did not allow sufficient time for the children to develop independence in word attack skills.

Continued studies need to be conducted on the most effective language units and sequences in beginning reading instruction. Researchers such as Venezky (1967), Coleman (1970) and others are adding informative pieces to the reading decoding puzzle. Some day, hopefully before too long, the decoding components may be analyzed, organized, and learned in such a way that this portion of reading will no longer be a problem.

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TABLE A

WORDS AND SYLLABLES USED IN INSTRUCTION

bat	Dade	nap	rode
bate	Dan	nape	rub
can	Dane	rat	rube
cane	hat	rate	tap
cat	hate	rob	tape
cate	mad	robe	tub
Dad	made	rod	tube

TABLE B

POST-TEST TRANSFER CHARTS

The children in Treatment Groups A (Grapheme-Phoneme Correspondence), C (Contrasting Spelling Patterns), and D (Whole Word) were tested in the following word order: beginning with Chart 1, going down the left column and then to the right; going to Chart 2, the left column and then the right.

The children in Treatment Group B were directed across the rows (e.g., from bad to fad), because this simulated their treatment's teaching method.

1.

bad	fad
bade	fade
cap	fap
cape	fape
cub	
cube	
dat	fat
date	fate

2.

lob	
lobe	
man	pan
mane	pane
mat	pat
mate	pate
zod	
zode	